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ABSTRACT

In response to the legislature's mandate to develop statewide curriculum standards for required subjects, this guide was developed by a statewide committee to present the content that should be taught in Mathematcs I. It was piloted by teachers in representative school systems and subsequently revised. Six goals for the course are listed, followed by a pacing chart suggesting the time to devote to each major topic in the course. The major topics are number concepts, real numbers, operations on whole numbers, extended number concepts, rational numbers, decimals, percent, relations and functions, measurement, geometry (informal), and operations on integers. The curriculum outline and performance objectives are then listed. In the following section, sample activities are presented, with content topic and objective noted for each. A brief list of books is given, but no answer key is provided. (MNS)

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MATHEMATICS 1

CURRICULUM GUIDE

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Louisiana State Department of Education

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State Superintendent

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DEPARTMENT OF PUBLIC EDUCATION

STATE OF LOUISIANA

BULLETIN 1608

1981

MATHEMATICS I CURRICULUM GUIDE

Issued by

Office of Academic Programs

J. KELLY NIX

State Superintendent

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FOREWORD

Curriculum guides have been developed for grades K-8 at the elementary level and for each mathematics course at the secondary level. These guides represent the best thinking of a selected statewide committee established to determine the scope of mathematics content which should be taught at each level.

The mathematics curriculum guides are another segment of the total educational program established by this administration and mandated by the Legislature in both the accountability and assessment and the competency-based education laws. This educational program requires that specific skills and concepts be established for each grade level and for each subject area. The mathematics curriculum guides with course outlines, performance objectives and coordinated activities effect this phase of the program.

It is hoped that the mathematics curriculum guides will make a major contribution to the improvement of mathematics instruction in the schools of Louisiana. This series of mathematics curriculum guides is another step toward achieving the goals of this administration.

J. KELLY NIX

ACKNOWLEDGMENTS

The Statewide Mathematics Curriculum Committee is to be commended for its work in the development of the Mathematics Curriculum Guide Series, K-12. Leadership for this project was provided by Dr. Jean Reddy Clement, Section Chief, Mathematics Section, Bureau of Secondary Education.

Supervisors in the Bureau of Elementary Education working under the direction of Mrs. Bonnie Ross, Elementary Supervisor, developed the activities for the K-8 guide. The activities for the secondary mathematics guides were written by a committee of secondary mathematics teachers and Dr. Clement. These dedicated educators are to be commended for their enthusiasm in undertaking this formidable project and for the superb quality of their contributions to this unique and comprehensive Mathematics Curriculum Series.

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INTRODUCTION

Act 750 of the 1979 Louisiana Legislature established the Louisiana Competency-Based Education Program. One of the most important provisions of Act 750 is the mandated "development and establishment of statewide curriculum standards for required subjects for the public elementary and secondary schools of this state...." The "statewide curriculum standards for required subjects" is defined as "the required subjects to be taught, curriculum guides which contain minimum skills and competencies, suggested activities, suggested materials of instruction, and minimum required time allotments for instruction in all subjects." Act 750 further provides that the "effective implementation date of the statewide curriculum standards for required subjects shall be the 1981-82 school year. Development of such curriculum shall begin by the 1979-80 school year."

During the 1978-79 school year, curriculum guides were developed by advisory and writing committees representing all levels of professional education and all geographic areas across the State of Louisiana for the following mathematics courses: Algebra I, Algebra II, Geometry, Advanced Mathematics, and Trigonometry. The major thrust of the curriculum development process in each of the guides has been the establishment of minimum standards for student achievement. Learning expectancies for mastery have been determined for each course and/or grade level. In addition, content outlines, suggested activities, procedures, and bibliographies have been developed as aids in support of the learning expectancies. The curriculum guides also contain activities designed to stimulate learning for those students capable of progressing beyond the minimums.

During the 1979-80 school year, the curriculum guides were piloted by teachers in school systems representing the different geographic areas of the state as well as urban, suburban, inner-city, and rural schools. The standard populations involved in the piloting reflected also the ethnic composition of Louisiana's student population. Participants involved in the piloting studies utilized the curriculum guides to determine the effectiveness of the materials that were developed. Based upon the participants' recommendations at the close of the 1979-80 pilot study, revisions were made in the curriculum guides to ensure that they are usable, appropriate, accurate, comprehensive, relevant, and clear.

These curriculum guides were implemented statewide in the 1980-81 school year. This stage must be understood in its operational context. The curriculum developers and the participants in the pilot studies do not stand alone in the State of Louisiana. Ultimately, local system supervisors, principals, and classroom teachers will have the responsibility for attaining this goal.

Following the established curriculum development procedures, curriculum guides for Mathematics I, Mathematics II, Consumer Mathematics, Business Arithmetic, and Computer Science were developed in 1979-80 and piloted in 1980-81. These curriculum guides now are ready for full program implementation.

As curriculum guides are implemented, the following guidelines should prove helpful:

...curriculum standards should be considered as the foundation for the year's instructional program. Where other programs are already in operation, these curricular materials must be checked with the foundation curricula to ensure that appropriate course and/or grade level standards are included and maintained.

...curricular activities contained in the guides provide a number of suggestions for helping students to achieve the established standards. Activities to meet the needs of "average," "below average," and "above average" students have been included in the appropriate guides. These activities should prove helpful as the teacher plans and organizes instruction. Additional activities, however, may supplement or be used in lieu of those listed in the guide as long as these activities are designed to achieve similar specific objectives.

...curricular suggestions for meeting the needs of the special child have been prepared by the Office of Special Educational Services. These suggestions are designed to provide help for teachers who work with special children in the regular classroom.

The continued effort of mathematics teachers to provide quality instruction will enhance our statewide goal to ensure that every student in the public elementary and secondary schools of the State of Louisiana has an opportunity to attain and to maintain skills that are considered essential to functioning effectively in society.

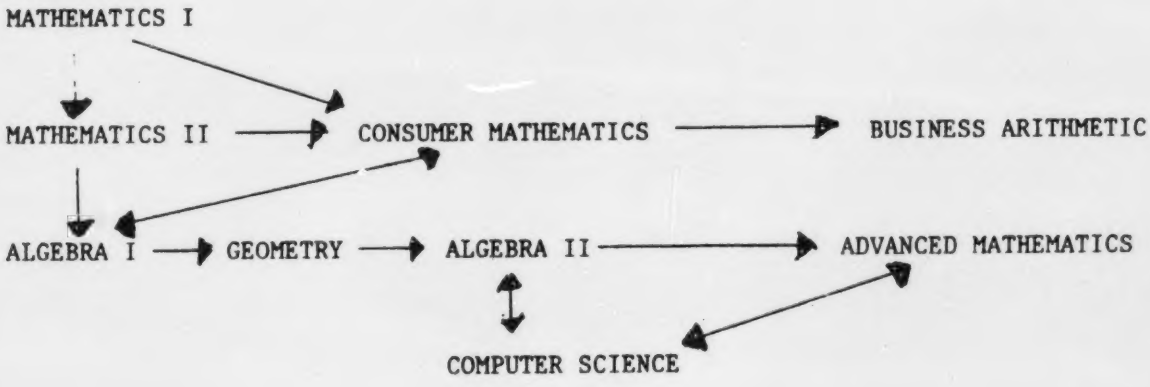
RATIONALE

Understanding the development of the entire set of mathematics curriculum guides is important to the proper use of the guides. This understanding is especially vital to the proper placement of students in the areas of Mathematics I, Mathematics II, Consumer Mathematics and Business Arithmetic. To avoid unnecessary duplication and repetition of content, the writing committee selected those topics which were deemed most appropriate for each of these courses. These topics were then eliminated from the content of the other courses or were treated with less emphasis.

Teachers and counselors need also to be aware of the difficulty levels of these courses. Mathematics I is the most fundamental course and is designed for those students entering ninth grade who have not acquired the basic skills in arithmetic. The stronger students who are still not quite prepared for success with Algebra I upon entering ninth grade should be encouraged to schedule Mathematics II. Mathematics II is designed to strengthen mathematical background and to prepare students for Algebra I and Geometry. Every student who plans to go to college should take Algebra I (at least). It is recommended that they also take Geometry and Algebra II.

Consumer Mathematics, as the name indicates, treats that mathematics which each of us encounters routinely as a citizen and consumer. The content differs from that of Business Arithmetic in that Business Arithmetic approaches the topics from the viewpoint of an employer or one engaged in business or manufacturing. It is not recommended that a student who has successfully completed Algebra II be allowed to take Mathematics I or Mathematics II.

The accompanying diagram should aid in understanding some possible avenues a student may take in his secondary mathematics career.



GOALS

Upon completion of the secondary course in Mathematics I, a student will be able to:

1. Develop a knowledge of number concepts.

2. Understand the basic concepts and methods of computation involving whole numbers, fractions, and decimals.

3. Interpret, construct, and apply graphs.

4. Demonstrate a working knowledge of the metric and customary systems.

5. Identify and compute the perimeter, area and volume of geometrical figures.

6. Solve problems in all areas of basic concepts using computational skills.

PACING CHART

	TOPIC	NUMBER OF WEEKS
I.	Number Concepts	2
II.	Real Numbers	
III.	Operations on Whole Numbers	4
IV.	Extended Number Concepts	2
V.	Rational Numbers	4
VI.	Decimals	4
VII.	Percent	3
VIII.	Relations and Functions	3
IX.	Measurement	4
X.	Geometry	4
XI.	Operations on Integers	3

MATHEMATICS I

CURRICULUM OUTLINE AND PERFORMANCE OBJECTIVES

MATHEMATICS I

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
I. NUMBER CONCEPTS	To demonstrate a basic understanding of number concepts, the student will be able to:
A. Roman Numerals	A. Read and write Roman Numerals.
B. Place Value	B. Recognize place value through millions.
C. Read and write natural numbers	C. Read and write number words through millions.
D. Round off natural numbers	D. Round natural numbers to any specified place through millions.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
II. REAL NUMBERS	To develop an understanding of the real numbers, the student will be able to:
A. Definition	A. Define and identify real numbers.
B. Subsets	B. Identify various subsets of the real numbers.
C. Field postulates	C. Identify and use the field postulates of the real numbers.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
III. OPERATIONS ON WHOLE NUMBERS	To demonstrate a basic understanding of whole numbers, the student will be able to:
A. Addition	A. Find the sum or approximate sum of columns of whole numbers by:
1. Definitions	1. Defining addends and sum.
2. Estimation	2. Estimation.
3. Sum	3. Performing the indicated addition.
B. Subtraction	B. Find the difference or approximate difference of two whole numbers by:
1. Definitions	1. Defining minuend, subtrahend, and difference.
2. Estimation	2. Estimation.
3. Difference	3. Performing the indicated subtraction.
C. Multiplication	C. Find the product or approximate product of two whole numbers by:
1. Definitions	1. Defining multiplier, multiplicand and product.
2. Estimation	2. Estimation.
3. Product	3. Performing the indicated multiplication.
D. Division	D. Find the quotient or approximate quotient of two whole numbers by:
1. Definitions	1. Defining divisor, dividend and quotient.
2. Estimation	2. Estimation.
3. Quotient	3. Performing the indicated division.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
Operations on Whole Numbers - Continued	
E. Powers of ten	E. Multiply and divide whole numbers by powers of ten.
F. Sequences - Optional	F. Find missing terms in sequences of whole numbers.
G. Application	G. Solve verbal problems that involve whole numbers.

CURRICULUM OUTLINE		PERFORMANCE OBJECTIVES	
IV.	EXTENDED NUMBER CONCEPTS		
	A. Tests for divisibility	A.	Apply the tests for divisibility to determine if a natural number is divisble by 2, 3, 5, or 10.
	B. Factors of natural numbers	B.	Factor composite natural numbers into the product of primes.
	C. Greatest common factor	C.	Find the greatest common factor of two or more natural numbers.
	D. Lease common multiple	D.	Find the least common multiple of two or more natural numbers.
	E. Squares and square roots	E.	Use a table or calculator to find the square and square root of any natural number.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
V. RATIONAL NUMBERS	To demonstrate a basic understanding of rational numbers, the student will be able to:
A. Definition	A. Define a rational number.
B. Equivalent fractions	B. Write one or more fractions that are equivalent to a given fraction.
C. Proper and improper	C. Identify proper and improper fractions.
D. Mixed numbers	D. Write improper fractions as mixed numbers and mixed numbers as improper fractions.
E. Reduce	E. Reduce fractions to lowest terms.
F. Addition	F. Add two or more fractions that have:
1. Same	1. The same denominator;
2. Different	2. Different denominators.
G. Subtraction	G. Subtract two fractions that have:
1. Same	1. The same denominator;
2. Different	2. Different denominators.
H. Multiplication	H. Multiply two or more fractions.
I. Division	I. Divide fractions
J. Compare	J. Compare and/or order two or more fractions.
K. Fractional relationships	K. Find a number when a fractional part of the number is given.
L. Application	L. Solve verbal problems that involve fractions.

CURRICULUM OUTLINE		PERFORMANCE OBJECTIVES	
VI.	DECIMALS		To demonstrate an understanding of decimals, the student will be able to:
	A. Read and write	A.	Read and write decimal numbers.
	B. Rounding decimals	B.	Round decimals to a designated place value.
	C. Addition	C.	Find the sum of two or more decimal numbers.
	D. Subtraction	D.	Find the difference of two decimal numbers.
	E. Multiplication	E.	Find the product of decimal numbers.
	F. Division	F.	Find the quotient of decimal numbers.
	G. Scientific notation	G.	Write numbers in scientific notation.
	H. Conversions	H.	Write fractions as decimals and decimals as fractions.
	I. Comparison	I.	Compare and/or order two or more decimal numbers.
	J. Application	J.	Solve verbal problems that involve decimal numbers.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
VII. PERCENT	To demonstrate a basic understanding of percent, the student will be able to:
A. Definition	A. Define percent.
B. Conversion	B. Write percent as decimals or fractions; decimals as fractions or percents; fractions as decimals or percents.
C. Percent of a number	C. Find a percent of a number.
D. Percent one number is of another	D. Find what percent one number is of another.
E. Number if a percent of it is known	E. Find a number if a percent of it is known.
F. Ratio and proportion	F.
1. Definition	1. Define a ratio and a proportion;
2. Ratio	2. Write the ratio of two numbers;
3. Missing terms	3. Find missing terms in proportions.
G. Applications	G. Solve verbal problems that involve percents, ratios and proportions.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
VIII. RELATIONS AND FUNCTIONS	To demonstrate an understanding of relations and functions, the student will be able to:
A. Identification	A. Identify bar graphs, line graphs, pictographs and circle graphs.
B. Construction	B. Construct a graph from given data or collected data.
C. Interpretation	C. Interpret the data illustrated by a graph.
D. Frequency distribution	D. Construct a frequency distribution from given data or collected data.
E. Central tendency (Optional)	E. Find the mean, median and mode of sets of data.
F. Percentiles and quartiles	F.
1. Percentile rank	1. Find the percentile rank of a given score;
2. Quartile score	2. Subdivide a set of scores into quartiles.
G. Probability	G. Find the number of permutations or combinations of n things taken r at a time.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
IX. MEASUREMENT	To demonstrate an understanding of measurement, the student will be able to:
A. Linear measure	A. Convert linear measure in:
	1. The United States system--inches to feet to yards, etc.
	2. The metric system, cm to dm, etc.
B. Square measure	B. Convert square measure in:
1. United States	1. The United States system--sq. in. to sq. ft. to sq. yd., etc.;
2. Metric	2. The metric system--cm^2 to dm^2, etc.
C. Capacity measure (liquid)	C. Convert capacity measures in:
1. United States	1. The United States system--cups to pints to quarts to gallons, etc.;
2. Metric	2. The metric system--mℓ, to ℓ, ℓ to mℓ, etc.
D. Weight measure	D. Convert weight measures in:
1. United States	1. The United States system--tons to pounds to ounces, etc.;
2. Metric	2. The metric system--kg to g to mg, etc.
E. Volume	E. Convert volume measures in:
1. United States	1. The United States system--cu. ft. to cu. yds., etc.;
2. Metric	2. The metric system--cubic centimeters to cubic decimeters, etc.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
Measurement - Continued	
F. Time	F. Convert hours to minutes to seconds, etc.
G. Temperature	G. Convert temperature from Centigrade to Fahrenheit and Fahrenheit to Centigrade.
H. Sums and differences	H. Find sums and differences of measures of length, capacity, area, weight, volume, and time using the customary and metric system measures.
I. Map reading	I. Recognize and use ratios in map reading.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
X. GEOMETRY (Informal)	To demonstrate a knowledge of geometry, the student will be able to:
A. Points, lines and planes	A.
1. Notation and terminology	1. Use proper notation to name points and subsets of lines and planes;
2. Identification	2. Identify the union and intersection of lines and/or planes and various subsets of lines.
B. Parallel and perpendicular lines	B. Identify the conditions for which two or more lines are perpendicular or parallel.
C. Angles	C. Name angles and:
1. Classify	1. Classify angles as acute, obtuse, right, or straight.
2. Measure	2. Measure angles by using a protractor.
D. Triangles	D. Name and classify a triangle according to: 1. Acute, right or obtuse 2. Scalene, isosceles, equilateral
E. Quadrilaterals	E. Identify the properties of the angles and sides of rectangles, squares, parallelograms, rhombuses, and trapezoids.
F. Polygons	F. Name and identify polygons and/or regular polygons.
G. Perimeter	G. Find the perimeter of triangles, squares, rectangles, parallelograms, and trapezoids.
H. Circumference	H. Find the circumference of circles.
I. Area	I. Use formulas to find the area of triangles, squares, rectangles, parallelograms, trapezoids, and circles.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
Geometry - Continued	
J. Volume	J. Use formulas to find the volume of:
1. Rectangular solid	1. A rectangular solid;
2. Cylinder	2. A right circular cylinder;
3. Sphere	3. A sphere;
4. Cone	4. A right circular cone;
5. Pyramid	5. A pyramid.
K. Surface area	K. Use formulas to find the surface area of a rectangular solid, a circular cylinder, and a sphere.
L. Construction	L. Use a straight edge and compass to:
1. Copy	1. Copy a segment, an angle, and a triangle;
2. Bisect	2. Bisect an angle and a segment;
3. Parallel	3. Construct lines parallel to a given line;
4. Perpendicular	4. Construct lines perpendicular to a given line.

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
XI. OPERATIONS OF INTEGERS	To demonstrate a basic understanding of integers, the student will be able to:
A. Definition	A. Define integers.
B. Absolute value	B. Find the absolute value of any integer.
C. Addition	C. Add two or more integers.
D. Subtraction	D. Subtract integers.
E. Multiplication	E. Multiply and divide integers.
F. Application	F. Solve verbal problems that involve integers.

ACTIVITIES

I. A. CONTENT: Number Concepts; Roman Numerals

OBJECTIVE: The student will be able to read and write Roman numerals.

ACTIVITIES: (a) Write the Arabic numerals as Roman numerals.

(1) 3
(2) 14
(3) 24
(4) 56

(b) Write each Roman numeral as an Arabic numeral.

(1) XIX
(2) XXXVII
(3) XXVI
(4) XXIII

B. CONTENT: Number Concepts; Place Value

OBJECTIVE: The student will be able to recognize place value through millions.

ACTIVITIES: (a) Name the place value of the underlined digit in each of the following:

(1) 5432
(2) 235,486
(3) 305,728
(4) 122,274,843

(b) Name the place value for each digit in each of the following:

(1) 9,328
(2) 407,222

C. CONTENT: Number Concepts; Read and Write Natural Numbers

OBJECTIVE: The student will be able to read and write number words through millions.

ACTIVITIES: (a) Read the following numbers:

(1) 2,653,428
(2) 27,605,207
(3) 15,009,072
(4) 867,214,309

(b) Write the numbers in part (a).

I. D. CONTENT: Number Concepts, Rounding Natural Numbers

OBJECTIVE: The student will be able to round natural numbers to any specified place through millions.

ACTIVITIES: (a) Round the numbers to the nearest ten.

(1) 23
(2) 654
(3) 5,476

(b) Round the numbers to the nearest thousand.

(1) 2,643
(2) 32,476
(3) 8,999

(c) Round the numbers to the nearest million.

(1) 2,567,842
(2) 9,499,999
(3) 247,842,312

II. A,B. CONTENT: Real Numbers; Definition, Subsets

OBJECTIVE: The student will be able to:
(a) Define and identify real numbers;
(b) Identify various subsets of the real numbers.

ACTIVITIES: Let A = {natural numbers}

Let B = {whole numbers}

Let C = {integers}

Let D = {rational numbers}

Let E = {irrational numbers}

Let F = {real numbers}

(a) Which of the above are subsets of F? of D? of C? of B?

(b) Find:

(1) $A \cup B$

(2) $A \cap B$

(3) $A \cap C$

(4) $D \cup E$

(5) $D \cap E$

(6) $B \cup D$

(7) $C \cap D$

(8) $A \cap B$

(9) $B \cap F$

(10) $C \cup D$

C. CONTENT: Real Numbers; Field Postulates

OBJECTIVE: The student will be able to identify and use the field postulate of the real numbers.

ACTIVITIES: (a) Name the postulate that justifies each of the following:

(1) $3 + 2 = 2 + 3$

(2) $(2)(3) = (3)(2)$

(3) $4(5 + 2) = 4(5) + 4(2)$

(4) $7 + 0 = 7$

(5) $6(3) + 6(5) = 6(3 + 5)$

(6) $(4)(5 \cdot 6) = (4 \cdot 5)6$

(7) $3 + (-3) = 0$

(8) $5 \cdot 1 = 5$

(9) $(-1)(3) = -3$

(10) $(8)(0) = 0$

(11) $(3 + 4) + 2 = 3 + (4 + 2)$

III. A. CONTENT: Operations on Whole Numbers; Addition

OBJECTIVE: The student will be able to find the sum of whole numbers.

ACTIVITIES: (a) Define addends and sums.

(b) Estimate the sum of the indicated place value.

(1)
348
562
855
723
hundreds

(2)
54,278
27,346
82,764
26,528
thousands

(3)
464,283
127,845
293,462
899,573
hundred thousands

(c) Add the columns of numbers in part (b)

B. CONTENT: Operations on Whole Numbers; Subtraction

OBJECTIVE: The student will be able to subtract whole numbers.

ACTIVITIES: (a) Define minuend, subtrahend and difference.

(b) Estimate the difference to the indicated place value.

(1)
413
283
hundreds

(2)
75,380
13,503
thousands

(3)
479,823
289,973
ten thousands

(4)
5,278,322
2,984,625
millions

(c) Find the differences of the numbers in part (b).

C. CONTENT: Operations on Whole Numbers; Multiplication

OBJECTIVE: The student will be able to multiply whole numbers.

ACTIVITIES: (a) Define multiplier, multiplicand and product.

(b) Estimate the product to the indicated place value.

(1)
34
73
thousands

(2)
256
436
hundred thousand

(3) $\begin{array}{r} 8{,}475 \\ \underline{\times\ \ 358} \end{array}$ million

(c) Find the products of the numbers in part (b).

III. D. CONTENT: Operations on Whole Numbers; Division

OBJECTIVE: The student will be able to divide whole numbers.

ACTIVITIES: (a) Define divisor, dividend, and quotient.

(b) Estimate the quotient to the indicated place value.

(1) $226\overline{)34{,}582}$ hundreds

(2) $1{,}980\overline{)40{,}666}$ tens

(3) $982\overline{)723{,}565}$ hundreds

(c) Find the quotient of the numbers in part (b).

E. CONTENT: Operations on Whole Numbers; Powers of Ten

OBJECTIVE: The student will be able to multiply and divide whole numbers by powers of ten.

ACTIVITIES: (a) Write each of the following as a power of ten.

(1) 100

(2) 10,000

(3) 100,000

(4) 10,000,000

(b) Perform the indicated operations.

(1) 34×1000

(2) 45×10^2

(3) 26×10^3

(4) 2.54×10^3

(5) $5{,}780 \div 10^3$

(6) $28{,}564 \div 10^3$

(7) $28{,}000 \div (2 \times 10^3)$

III. F. CONTENT: Operations on Whole Numbers; Sequences - Optional

OBJECTIVE: The student will be able to find missing terms in sequence of whole numbers.

ACTIVITIES: Find the missing terms in each of the following sequences:

(a) 11, 15, 19, ____, ____.

(b) 52, 41, 32, ____, ____.

(c) 10, 12, ____, ____, 18.

(d) 2, 4, 8, ____, ____.

(e) 1,024, 256, 64, ____, ____.

(f) 3, 5, 9, 17, ____, ____.

(g) 1, 1, 2, 3, 5, 8, ____, ____.

G. CONTENT: Operations on Whole Numbers; Application

OBJECTIVE: The student will be able to solve verbal problems that involve whole numbers.

ACTIVITIES:

(a) An experienced sales clerk earns $11,375. A beginning clerk earns $8,100 per year. How much more does an experienced clerk earn?

(b) An insurance salesman earns $32.50 for each new contract written. One week he wrote 16 contracts. What were his earnings for that week?

(c) A plot of land contains 87,120 sq. rods. If it is to be divided into 15 lots of equal size, find the area of each lot.

(d) One diving mask costs $19.23. How much would 8 diving masks cost?

(e) A boating club buys 32 oars for $832. Find the cost of one oar.

(f) In a magic square, the sum of the numbers in each row, column, and diagonal is the same. Complete the magic square below.

32		4	
10	20		16
	12	14	
8		28	2

IV. A. CONTENT: Number Concepts; Tests for Divisibility

OBJECTIVE: The student will be able to apply tests for divisibility to determine if a natural number is divisible by 2, 3, 5, or 10.

ACTIVITIES: Which of the following numbers are divisible:

(a) by 2?

(1) 234 (2) 481 (3) 5,500

(b) by 3?

(1) 312 (2) 3,007 (3) 321,729
(4) 10,032,141

(c) by 5?

(1) 5,120 (2) 6,124 (3) 30,055

(d) by 10?

(1) 2,050 (2) 6,005 (3) 172,855,260

B. CONTENT: Number Concepts; Factors of Natural Numbers

OBJECTIVE: The student will be able to factor composite natural numbers as the product of primes.

ACTIVITIES: Write each number as the product of primes.

(a) 72
(b) 375
(c) 840
(d) 792

C,D. CONTENT: Number Concepts; Greatest Common Factor, Least Common Multiple

OBJECTIVE: The student will be able to:

(a) Find the greatest common factor of two or more natural numbers;

(b) Find the least common multiple of two or more natural numbers'.

ACTIVITIES: (a) Find the greatest common factor of:

(1) 21 and 35.

(2) 18 and 24.

(3) 15 and 40.

(4) 9, 18 and 45.

(5) 21, 84 and 343.

(6) 65, 91 and 156.

(b) Find the least common multiple of:

(1) 12 and 18.

(2) 42 and 48.

(3) 64 and 116.

(4) 60, 30 and 16.

(5) 15, 12 and 45.

IV. E. CONTENT: Number Concepts; Squares and Square Roots

OBJECTIVE: The student will be able to find the square and square root of any natural number.

ACTIVITIES: Use a table or calculator to find the square and square root of:

(1) 11

(2) 27

(3) 19

V. A,B. CONTENT: Rational Numbers; Definition, Equivalent Fractions

OBJECTIVE: The student will be able to:

(a) Define a rational number;

(b) Write one or more fractions that are equivalent to a given fraction.

ACTIVITIES: Supply the missing information:

(a) $\frac{1}{2} = \frac{?}{4}$ (b) $\frac{3}{8} = \frac{?}{24}$ (c) $\frac{5}{3} = \frac{?}{27}$

(d) $\frac{5}{12} = \frac{?}{24} = \frac{?}{48}$

C. CONTENT: Rational Numbers; Proper and Improper Fractions

OBJECTIVE: The student will be able to identify proper and improper fractions.

ACTIVITIES: (a) Circle the proper fractions.

(1) $\frac{7}{8}$ (2) $\frac{8}{5}$ (3) $\frac{1}{2}$ (4) 7

(b) Circle the improper fractions.

(1) $\frac{3}{7}$ (2) $\frac{11}{10}$ (3) 5 (4) $\frac{25}{21}$

D. CONTENT: Rational Numbers; Mixed Numbers

OBJECTIVE: The student will be able to write improper fractions as mixed numbers and mixed numbers as improper fractions.

ACTIVITIES: (a) Write each mixed number as an improper fraction.

(1) $2\frac{1}{9}$ (2) $3\frac{1}{5}$ (3) $7\frac{2}{7}$ (4) $3\frac{5}{3}$

(b) Write each improper fraction as a mixed number.

(1) $\frac{6}{5}$ (2) $\frac{29}{9}$ (3) $\frac{56}{13}$ (4) $\frac{147}{23}$

F. CONTENT: Rational Numbers; Reducing

OBJECTIVE: The student will be able to reduce fractions to lowest terms.

ACTIVITIES: Reduce each fraction to lowest terms

(a) $\frac{10}{12}$ (b) $\frac{15}{45}$ (c) $\frac{60}{84}$ (d) $\frac{105}{285}$

V. F. CONTENT: Rational Numbers; Addition

OBJECTIVE: The student will be able to add two or more fractions that have;

(a) The same denominator;

(b) Different denominators.

ACTIVITIES: Add:

(a) $\frac{2}{7}$ (b) $2\frac{4}{9}$ (c) $\frac{1}{4}$ (d) $5\frac{3}{5}$

$\frac{3}{7}$ $3\frac{2}{9}$ $\frac{3}{8}$ $2\frac{2}{5}$

(e) $8\frac{1}{8}$ (f) $3\frac{1}{4}$

$12\frac{5}{10}$ $2\frac{3}{8}$

$4\frac{1}{9}$

G. CONTENT: Rational Numbers; Subtraction

OBJECTIVE: The student will be able to subtract two fractions that have;

(a) The same denominator;

(b) Different denominators

ACTIVITIES: Subtract:

(1) $\frac{7}{9}$ (2) $5\frac{7}{12}$ (3) $\frac{5}{6}$ (4) $6\frac{3}{10}$

$\frac{4}{9}$ $2\frac{3}{12}$ $\frac{2}{9}$ $2\frac{7}{8}$

V. H,I. CONTENT: Rational Numbers; Multiplication, Division

OBJECTIVE: The student will be able to multiply and divide fractions.

ACTIVITIES: Perform the indicated operations.

(1) $\frac{3}{4} \times \frac{8}{15}$

(2) $2\frac{1}{3} \times 1\frac{1}{5}$

(3) $5 \times 3\frac{1}{10}$

(4) $\frac{9}{10} \div \frac{3}{5}$

(5) $12 \div 3\frac{1}{2}$

(6) $6\frac{1}{4} \div 5$

(7) $5\frac{11}{15} \div 2\frac{4}{5}$

(8) $6\frac{2}{3} \times 4\frac{1}{2} \div 1\frac{3}{4}$

J. CONTENT: Rational Numbers; Compare

OBJECTIVE: The student will be able to compare and/or order two or more fractions.

ACTIVITIES: Arrange each set of fractions from least to greatest.

(1) $\frac{2}{3}, \frac{3}{4}, \frac{1}{2}$

(2) $\frac{7}{8}, \frac{2}{3}, \frac{7}{9}$

(3) $\frac{5}{12}, \frac{3}{8}, \frac{7}{16}$

K. CONTENT: Rational Numbers; Fractional Relationships

OBJECTIVE: The student will be able to find a number when a fractional part of the number is given.

ACTIVITIES:

(1) 3/4 of what number is 12?

(2) 60 is $\frac{2}{3}$ of what number?

(3) $2\frac{2}{3}$ of what number is 16?

(4) 72 is $\frac{9}{16}$ of what number?

V. L. CONTENT: Rational Numbers; Application

OBJECTIVE: The student will be able to solve verbal problems that involve fractions.

ACTIVITIES:

(1) One cookie recipe makes $3\frac{1}{4}$ dozen cookies; another recipe makes $2\frac{1}{2}$ dozen cookies. How many cookies is this in all?

(2) Hazel uses $2\frac{1}{4}$ yards of material to make a dress. How many yards does she need to make six dresses?

(3) If it takes $\frac{3}{4}$ of a yard of ribbon to trim a dress, how many dresses can be trimmed with $4\frac{1}{2}$ yards of ribbon?

(4) Sam hiked $4\frac{1}{6}$ miles and Ann hiked $6\frac{7}{10}$ miles. How much further did Ann hike?

VI. A. CONTENT: Decimals; Read and Write

OBJECTIVE: The student will be able to read and write decimal numbers.

ACTIVITIES: (a) Read the decimals.

(1) 3.46

(2) 10.101

(3) 7.002

(4) .0103

(b) Write each mixed decimal in standard form.

(1) Three and five thousandths

(2) Three hundred eighty-four and fifteen thousandths

(3) Seven hundred and five hundred six ten-thousandths

B. CONTENT: Decimals; Rounding Decimals

OBJECTIVE: The student will be able to round decimals to a designated place value.

ACTIVITIES: (a) Round to the nearest tenth.

(1) 13.28 (2) 6.73 (3) 506.93

(b) Round to the nearest hundredth.

(1) 8.262 (2) 645.728 (3) 8.996

(c) Round to the nearest thousandth.

(1) 9.443 (2) 8.5566 (3) 5.3997

C,D. CONTENT: Decimals; Addition, Subtraction

OBJECTIVE: The student will be able to:

(a) Find the sum of two or more decimal numbers;

(b) Find the difference of two decimal numbers.

ACTIVITIES: (a) Add:

(1) $\begin{array}{r} 164.346 \\ 7.392 \\ \hline \end{array}$ (2) $\begin{array}{r} 0.896 \\ 0.437 \\ 0.624 \\ \hline \end{array}$

(3) $500.34 + 2073.8 + .0068 + 5012.28 =$ _____

(b) Subtract:

(1) $\begin{array}{r} 15.43 \\ 3.5 \\ \hline \end{array}$ (2) $\begin{array}{r} 609.287 \\ 389.998 \\ \hline \end{array}$ (3) $\begin{array}{r} 12.0560 \\ 9.9897 \\ \hline \end{array}$

VI. E,F. CONTENT: Decimals; Multiplication, Division

OBJECTIVE: The student will be able to:

(a) Find the product of decimal numbers;

(b) Find the quotient of decimal numbers.

ACTIVITIES: (a) Multiply:

(1) $\begin{array}{r} 6.14 \\ .34 \\ \hline \end{array}$ (2) $\begin{array}{r} .256 \\ .348 \\ \hline \end{array}$ (3) $\begin{array}{r} 50.29 \\ 6.23 \\ \hline \end{array}$

(b) Divide:

(1) $.08\overline{)0.752}$ (2) $1.64\overline{)15.088}$

(3) $6.104\overline{)35.287}$

G. CONTENT: Decimals; Scientific Notation

OBJECTIVE: The student will be able to write numbers in scientific notation.

ACTIVITIES: Write each number in scientific notation.

(1) 2000.

(2) 0.026

(3) 5,020,000

(4) 0.00216

(5) 0.000025

(6) 4,280.

VI. H. CONTENT: Decimals; Conversion

OBJECTIVE: The student will be able to write fractions as decimals and decimals as fractions.

ACTIVITIES: (a) Write each decimal as a fraction that is reduced to lowest terms.

(1) .8 (2) .42 (3) .008 (4) .125

(5) .625 (6) .0016 (7) $.83\frac{1}{3}$ or $.8\bar{3}$

(b) Write each fraction as a decimal.

(1) $\frac{3}{8}$ (2) $\frac{2}{5}$ (3) $\frac{4}{12}$ (4) $\frac{7}{5}$

I. CONTENT: Decimals; Compare

OBJECTIVE: The student will be able to compare and/or order two or more decimals.

ACTIVITIES: Write the decimals in order from least to greatest.

(1) 6.07, 6.70, .67

(2) .467, .46, .4067

(3) 6.3, 6.030, 6.29

J. CONTENT: Decimals; Application

OBJECTIVE: The student will be able to solve verbal problems that involve decimal numbers.

ACTIVITIES: (a) John drove 58.4 miles on Saturday and 76.8 miles on Sunday. How many miles did he drive in the two days?

(b) A tablespoon is 20.7 cm long. A teaspoon is 15.3 cm in length. How much longer is the tablespoon?

(c) A moon rock weighs 1.3 kg on the moon. Its weight on earth is 6 times as much. How much does the moon rock weigh on earth?

(d) A package of 12 felt tip pens can be bought for $2.16. How much does a pen cost?

(e) Each container of Chemical X holds 132.7 lbs. How many pounds are needed to fill 42.5 containers?

(e) The distance from Baton Rouge to Shreveport is 297.6 miles. If a car averages 16.25 miles per gallon, how much gas will be needed? If gas costs $1.50 per gallon, how much is the cost of gasoline for a round trip?

VII. A,B. CONTENT: Percent; Definition, Conversions

OBJECTIVE: The student will be able to:

(a) Define percent;

(b) Write percents as decimals or fractions; fractions as decimals or percent; percent as decimals or fractions.

ACTIVITIES: Supply the missing information.

Percent	Decimal	Fraction
70%	?	?
20%	?	?
87½%	?	?
?	?	18/25
?	?	7/5
?	.008	?
2.8%	?	?

C. CONTENT: Percent; Percent of a Number

OBJECTIVE: The student will be able to find a percent of a number.

ACTIVITIES: (a) Find 20% of 60.

(b) Find 75% of 380.

(c) Find 250% of 18.

(d) Find 3/4% of 24.

(e) Find .6% of 1200.

(f) Find 33 1/3% of 600.

(g) Find 9 3/4% of 270.

D. CONTENT: Percent; Percent One Number is of Another

OBJECTIVE: The student will be able to find what percent one number is of another.

ACTIVITIES: (a) What percent of 36 is 9?

(b) 3 is what percent of 600?

(c) 18 is what percent of 12?

(d) .8 is what percent of 6?

(e) What percent of 4.8 is 1.2?

VII. E. CONTENT: Percent; Number if a Percent of it is Known

OBJECTIVE: The student will be able to find a number if a percent of it is known.

ACTIVITIES: (a) 6 is 20% of what number?

(b) 75% of what number is 240?

(c) 250% of what number is 30?

(d) 5½% of what number is 16.5?

(e) 83 1/3% of what number is 90?

(f) 24 is 3/4% of what number?

(g) 137½% of what number is 220?

F. CONTENT: Percent; Ratio and Proportion

OBJECTIVE: The student will be able to

(a) Define a ratio and a proportion;

(b) Find the ratio of two numbers;

(c) Find missing terms in proportions.

ACTIVITIES: Write the ratio of:

(1) 8 to 24

(2) 6 in. to 36 in.

(3) 8 months to 6 years

(4) 36 hours to 4 days

(5) $.75 to $6.00

(b) Supply the missing information.

(1) $\frac{1}{2} = \frac{?}{16}$

(2) $\frac{5}{?} = \frac{20}{16}$

(3) $\frac{4}{10} = \frac{14}{?}$

(4) $\frac{3.5}{1.05} = \frac{14}{?}$

(5) $\frac{24}{1\frac{1}{2}} = \frac{?}{2}$

(6) $\frac{?}{5.5} = \frac{2.6}{22}$

(c) (1) A pendulum completes two swings every three seconds. How many swings will it make in 60 seconds?

(2) If Paul can pick 2 bushels of peaches in 30 minutes, how many bushels can he pick in eight hours?

VII. G. CONTENT: Percent; Applications

OBJECTIVE: The student will be able to solve verbal problems that involve percent.

ACTIVITIES:

(a) An article that is purchased for $40 is sold for $44. Find the percent increase.

(b) A jacket was reduced in price from $75 to $50. What is the percent decrease?

(c) Floyd borrowed $7,500 from the bank at 18½ percent simple interest. If he paid the note 270 days later, how much interest did he pay?

(d) Jim gets a salary plus commission. His salary is $175 per week and his commission is 3% of his sales. If his sales for one week were $2,700, what was his total income that week?

VIII. A,B. CONTENT: Relations and Functions; Identification and Construction

OBJECTIVE: The student will be able to identify and construct:

(a) Bar graphs;

(b) Line graphs;

(c) Pictographs;

(d) Circle graphs.

ACTIVITIES: (a) The senior class held an election to decide on its class colors. The result of the election is given below. Prepare a bar graph to show this information.

Colors	Number of Votes
Red and White	5
Red and Blue	7
Blue and White	4
Green and White	10
Green and Blue	2
Green and Gold	13
Gold and Red	3
Red and Black	6

(b) The high temperature for each day of one week is shown below. Construct a line graph to show this data.

Day	Temperature
Monday	37°C
Tuesday	21°C
Wednesday	26°C
Thursday	19°C
Friday	17°C
Saturday	21°C
Sunday	20°C

(c) A recent survey of the highest education completed by the U.S. adult population revealed the information given below. Prepare a circle graph to show this data.

School	% Population
8th grade or less	35
1 to 4 years high school	45
1 to 4 years college	15
More than 4 years college	5

VIII. C. CONTENT: Relations and Functions; Interpretation

OBJECTIVE: The student will be able to interpret data illustrated by graphs.

ACTIVITIES: Use the exercises from the previous sections to answer the following questions:

(a) Use the graph of part (a) to determine how many students were in the senior class. If a run off is necessary, which two categories will be voted on?

(b) Use the graph of part (b) to determine the highest and lowest temperatures. Find the difference between the highest and lowest temperatures. This difference is called the range of the temperatures.

(c) Use the graph of part (c) to determine the percent of the adults in the United States that have at least one year of college. If the adult population is 100 million, how many adults are in each category?

D. CONTENT: Relations and Functions; Frequency Distribution

OBJECTIVE: The student will be able to construct a frequency distribution from given data or collected data.

ACTIVITIES: (a) Make a frequency distribution for the following sets of scores:

99, 74, 84, 79, 89, 69, 84, 79, 95, 65, 74, 84, 79, 65, 89, 59, 84, 74, 79, 95, 59, 79, 65, 84, 84, 79, 74, 84, 69, 89

(b) Which score occurs most frequently?

(c) How many students scored below 80?

(d) If 93 to 100 represents an A, how many students receive an A. What percent of the students received A's?

E. CONTENT: Relations and Functions; Central Tendency

OBJECTIVE: The student will be able to find the mean, median and mode of a set of data.

ACTIVITIES: Find the mean, median and mode for the following sets of scores:

(1) 10, 12, 16, 14, 15, 13, 14

(2) 75, 70, 55, 85, 90, 75, 65, 80, 70, 75, 65, 60, 90, 80, 75

VIII. F. CONTENT: Relations and Functions; Percentiles and Quartiles

OBJECTIVE: The student will be able to:

(a) Find the percentile rank of a given score;

(b) Subdivide a set of scores into quartiles.

ACTIVITIES: (a)

(1) If Bob ranked 12th in a class of 64, find his percentile rank.

(2) If Sue ranked 18th in a class of 24, find her percentile rank.

(b) Find the 50th percentile and the upper and lower quartiles for the set of scores:

97, 92, 52, 57, 57, 67, 72, 78, 78, 82, 82, 92

Optional

G. CONTENT: Relations and Functions; Probability

OBJECTIVE: The student will be able to find the number of permutations or combinations of n things taken r at a time.

ACTIVITIES: (a) Find the number of permutations that can be made from five things taken three at a time.

(b) Find ${}_8P_5$.

(c) In how many ways can five students be seated in a row?

(d) How many combinations can be made from 7 things taken 3 at a time?

(e) Find ${}_8C_5$.

(f) In how many ways can a committee of six be selected from 14 persons?

IX. A. CONTENT: Measurement; Linear Measure

OBJECTIVE: The student will be able to convert linear measure in:

(a) The United States system--inches to feet to yards, etc.;

(b) The metric system--cm to m, etc.

ACTIVITIES: Supply the missing information.

(a)

(1) 2 ft. = _____ in.

(2) 3 yd. = _____ ft.

(3) 2 yd. = _____ in.

(4) 79 in. = _____ ft. _____ in.

(5) 1320 ft. = _____ yd.

(6) 7920 yd. = _____ mi.

(b)

(1) 2 m = _____ cm

(2) 72 m = _____ dkm

(3) 172 m _____ km

(4) 12 dkm = _____ cm

(5) 15 cm = _____ mm

B. CONTENT: Measurement; Square Measures

OBJECTIVE: The student will be able to convert square measures in:

(a) The United States system--sq. ft. to sq. yds., etc.

(b) The metric system--cm^2 to m^2, etc.

ACTIVITIES: Supply the missing information.

(a)

(1) 2 sq. ft. = _____ sq. in.

(2) 5 sq. yd. = _____ sq. ft.

(3) 108 sq. ft. = _____ sq. yd.

(4) 2,592 sq. in. = _____ sq. ft.

(b)

(1) 1 km^2 = _____ m^2

(2) 30,000 cm^2 = _____ m^2

(3) 5 cm^2 = _____ mm^2

(4) 900 cm^2 = _____ dm^2 = _____ m^2

IX. C. CONTENT: Measurement; Capacity Measures

OBJECTIVE: The student will be able to convert capacity measures in:

(a) The United States system--cups to pints to quarts to gallons, etc.

(b) The metric system--m $\ell$to ℓ, ℓ to mℓ, etc.

ACTIVITIES: Supply the missing information

(a)

(1) 3 qt. = _____ pts.

(2) 2 gal. = _____ qts.

(3) 6 qts. = _____ gal.

(4) 16 cups = _____ pts. = _____ qts. = _____ gal.

(5) 4 gal. = _____ qts. = _____ pts. = _____ cups

(b)

(1) 3.2 ℓ = _____ mℓ.

(2) 46,000 m ℓ= _____ ℓ.

(3) 2,500 dk ℓ = _____ ℓ.

(4) 6,400 ℓ = _____ k ℓ

IX. D. CONTENT: Measurement; Weight Measures

OBJECTIVE: The student will be able to convert weight measures in:

(a) The United States system--tons to pounds to ounces, etc.;

(b) The metric system--kg to g to mg, etc.

ACTIVITIES: Supply the missing information.

(a)

(1) 3 lb. = _____ oz.

(2) 6,000 lbs. = _____ tons

(3) 160,000 oz. = _____ lbs.

(4) 3.5 tons = _____ lbs.

(b)

(1) 2000 g = _____ kg

(2) 3 cg = _____ g

(3) 1 kg = _____ dg

(4) 3.4 kg = _____ g

E. CONTENT: Measurement; Volume Measures

OBJECTIVE: The student will be able to convert volume measures in:

(a) The United States system-- cu. ft. to cu. yds., etc.;

(b) The metric system--cubic decimeters to cubic centimeters, etc.

ACTIVITIES: Supply the missing information.

(a)

(1) 54 cu. ft. = _____ cu. yd.

(2) 1 cu. ft. = _____ cu. in.

(3) 5 cu. yd. = _____ cu. ft.

(4) 5456 cu. in. = _____ cu. ft.

(b)

(1) 2 m^3 = _____ dm^3

(2) 2 dm^3 = _____ cm^3

(3) 100,000 cm^3 = _____ m^3 = _____ dm^3

IX. F. CONTENT: Measurement; Time

OBJECTIVE: The student will be able to convert hours to minutes to seconds, etc.

ACTIVITIES: Supply the missing information.

(1) 3 hours = _____ min.

(2) 12 min. = _____ sec.

(3) 2½ days = _____ hrs.

(4) 720 min. = _____ hr. = _____ sec.

(5) 158 hr. = _____ days.

G. CONTENT: Measurement; Temperature

OBJECTIVE: The student will be able to convert Centigrade temperature to Fahrenheit and Fahrenheit temperature to Centigrade.

ACTIVITIES: (a) Convert the Fahrenheit temperature readings to Centigrade.

(1) 50°F.

(2) -40°F.

(3) 77°F.

(4) 95°F.

(b) Convert the Centigrade temperature readings to Fahrenheit.

(1) 20°C

(2) -40°C

(3) 80°C

(4) 32°C

IX. H. CONTENT: Measurement; Sums and Differences

OBJECTIVE: The student will be able to find sums and differences of measures of length, capacity, area, weight, volume and time in the United States and/or metric system.

ACTIVITES: Find the sum. Find the difference.

(a) Time.

(1) 16 hrs. + 45 min.
4 hrs. + 18 min.

(2) 10 hrs. + 10 min.
8 hrs. + 45 min.

(b) Length.

(1) 12 ft. + 5 in.
8 ft. + 13 in.

(2) 13 ft. + 4 in.
9 ft. + 8 in.

(c) Area.

(1) $8\ ft^2 + 177\ in^2$
$7\ ft^2 + 63\ in^2$

(2) $37\ yd^2 + 5\ ft^2$
$8\ yd^2 + 7\ ft^2$

(3) $30\ m^2 + 65\ dm^2 + 48\ cm^2$
$60\ m^2 + 34\ dm^2 + 56\ cm^2$

(4) $30\ m^2$
$17\ m^2 + 16\ dm^2 + 37\ cm^2$

(d) Capacity.

(1) 4 gal + 2 qt + 1 pt + 1 cup
5 gal + 3 qt + 2 pt + 1 cup

(2) 4 gal + 3 qt
1 gal + 3 qt + 1 pt

(3) 3 ℓ + 50 mℓ
8 ℓ + 100 mℓ

(4) 5 ℓ + 6 dℓ
2 ℓ + 8 dℓ + 4 mℓ

(e) Weight.

(1) 3 tons + 1500 lbs
2 tons + 700 lbs

(2) 12 lbs + 3 oz
9 lbs + 7 oz

(3) 2 kg + 13 dg + 6 g
5 kg + 22 dg +32 g

(2) 2 kg
1 kg + 1 hg + 5 g

(f) Volume.

(1) 5 cu yd + 8 cu ft + 90 cu in
2 cu yd + 7 cu ft + 85 cu in

(2) 4 cu yd + 5 cu ft
1 cu yd + 8 cu ft +12 cu in

(3) 10 cu yd + 20 cu ft
5 cu yd + 30 cu ft

(4) 10 cu yd
5 cu yd + 8 cu ft + 5,400 cu in

IX. I. CONTENT: Measurement; Map Reading

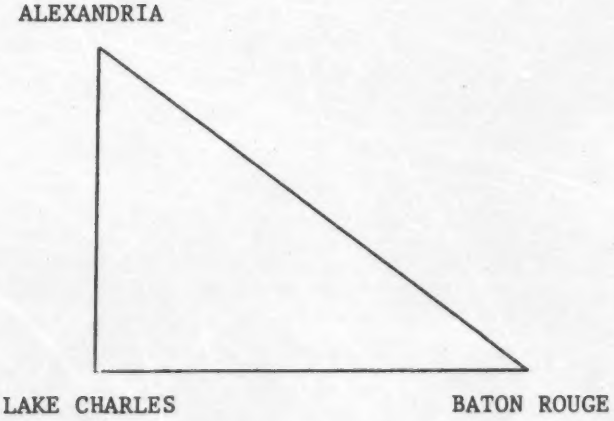
OBJECTIVE: The student will be able to recognize and use ratios in map reading.

ACTIVITIES: If ½" represents 10 miles, find:

(a) The distance from Alexandria to Lake Charles.

(b) The distance from Lake Charles to Baton Rouge.

(c) The distance from Alexandria to Baton Rouge.



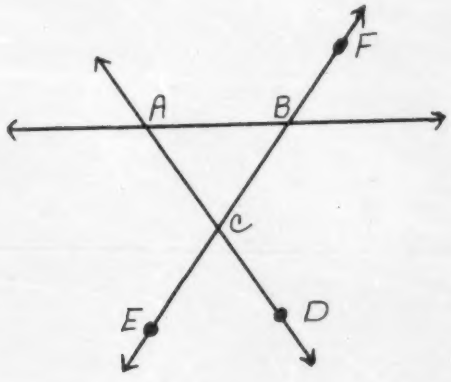
X. A. CONTENT: Geometry; Points, Lines and Planes

OBJECTIVE: The student will be able to:

(a) Use proper notation to name points and subsets of lines and planes;

(b) Identify the union and intersection of lines and/or planes and various subsets of lines.

ACTIVITIES:



(a) Use the diagram to answer the following:

(1) Name 3 lines in the diagram.

(2) What is the intersection of $\overline{BE}$ and $\overline{BC}$?

(3) Name 2 rays whose endpoints are point C.

(4) Find the intersection of $\overline{CB}$ and $\overline{BC}$.

(5) Find two segments whose union is $\overline{AD}$.

(6) What is the union of $\overline{CF}$ and $\overline{CE}$?

(b) How many planes can contain:

(1) Three collinear points?

(2) Three noncollinear points?

(3) Two intersecting lines?

(4) A line and a point not on it?

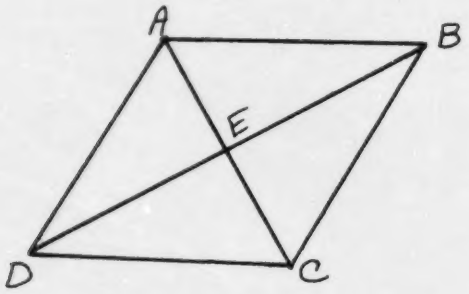
X. B,C. CONTENT: Geometry; Parallel and Perpendicular Lines; Angles

OBJECTIVE: The student will be able to:

(a) Identify the conditions for which two or more lines are perpendicular or parallel;

(b) Name and classify angles as acute, obtuse, right, or straight angles.

ACTIVITIES:



(a) (1) Find two pairs of lines that appear to be parallel.

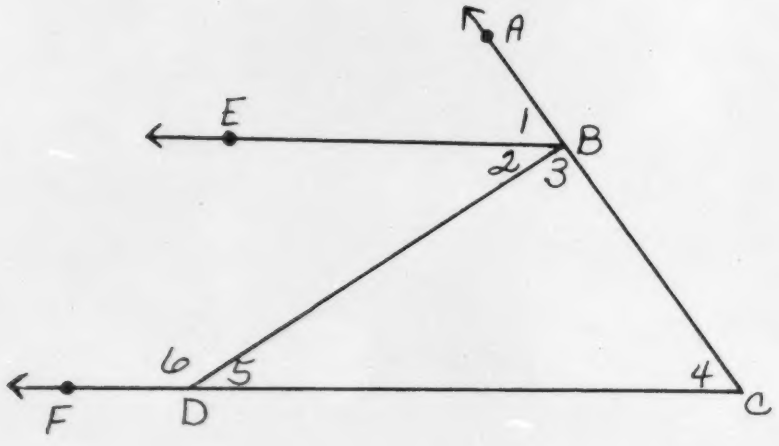
(2) Find two lines that appear to be perpendicular.

(3) Lines $\overline{DB}$ and $\overline{AC}$ intersect at point _____.

(4) Find two angles that appear to be obtuse.

(5) Find four angles that appear to be acute.

(6) Name an angle that appears to be a right angle.



(b) (1) Name two lines that intersect.

(2) Name two lines that appear to be perpendicular.

(3) Name two lines that appear to be parallel.

(4) Find two angles that appear to be obtuse.

(5) Find four angles that appear to be acute.

(6) Name two angles that appear to be right angles.

X. D. CONTENT: Geometry; Triangles

OBJECTIVE: The student will be able to name and classify a triangle according to:

(a) Acute, right or obtuse;

(b) Scalene, isosceles, or equilateral.

ACTIVITIES: (a) Which of the following statements are true?

(1) Every equilateral triangle is isosceles.

(2) Every isosceles triangle is equilateral.

(3) A right triangle may be isosceles.

(4) An acute triangle may be isosceles.

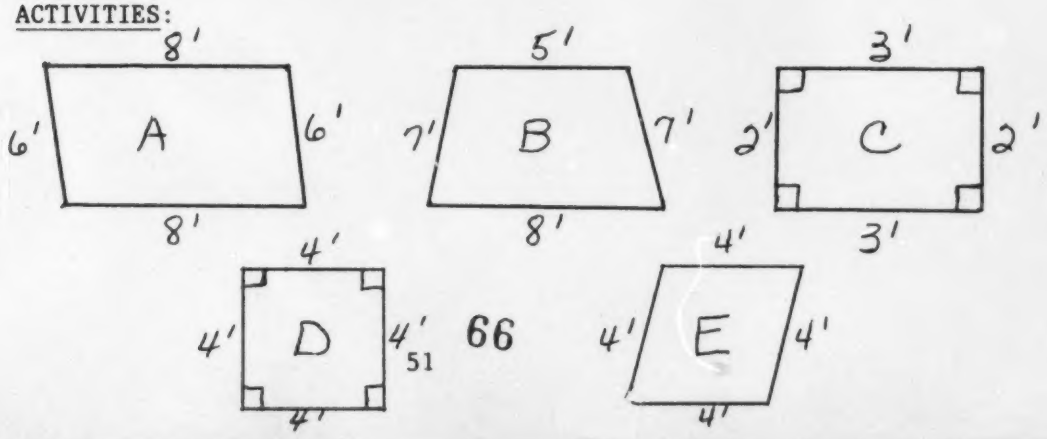
(5) An obtuse triangle may also contain a right angle.

(6) An equilateral triangle may be obtuse.

E. CONTENT: Geometry; Quadrilaterals

OBJECTIVE: The student will be able to identify the properties of the angles and sides of rectangles, squares, parallelograms, rhombuses, and trapezoids.

ACTIVITIES:



(a) For this exercise, assume that lines that appear to be parallel are parallel.

(1) Which of the quadrilaterals are parallelograms?

(2) Which of the quadrilaterals are rectangles?

(3) Which of the quadrilaterals are rhombuses?

(4) Which of the quadrilaterals are squares?

(5) Which of the quadrilaterals are trapezoids?

(b) Which of the following are true?

(1) Every square is a rectangle.

(2) Every rectangle is a parallelogram.

(3) Every square is a rhombus.

(4) Every rhombus is a square.

(5) Every rectangle is a square.

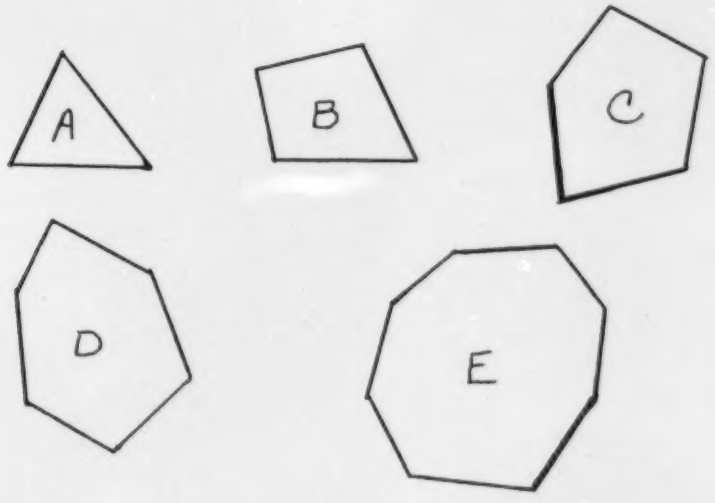
(6) Every parallelogram is a rectangle.

(7) Every rectangle is a parallelogram.

X. F. CONTENT: Geometry; Polygons

OBJECTIVE: The student will be able to name and identify polygons and/or regular polygons.

ACTIVITIES: (a) Name the polygons.



(b) Draw a triangle, a quadrilateral, a pentagon, and a hexagon. Use your protractor and find the sum of the measures of the angles of each polygon. Do you observe a pattern? If so, what pattern?

X. G. CONTENT: Geometry; Perimeter

OBJECTIVE: The student will be able to find the perimeter of triangles, rectangles, parallelograms, and trapezoids.

ACTIVITIES: (a) Find the length of a side of a square whose perimeter is 36 inches.

(b) Two consecutive sides of a parallelogram are $3\frac{1}{12}$ inches and $2\frac{1}{6}$ inches, respectively. Find the perimeter of the parallelogram.

H. CONTENT: Geometry; Circumference

OBJECTIVE: The student will be able to find the circumference of circles.

ACTIVITIES: (a) Find the circumference of a circle whose radius is 5 inches. (Use 3.14 for π)

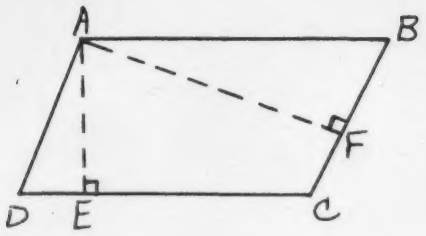
(b) The circumference of a circle is 44 in. Find the diameter of a circle. (Use $\frac{22}{7}$ for π).

I. CONTENT: Geometry; Area

OBJECTIVE: The student will be able to find the area of triangles, squares, rectangles, parallelograms, trapezoids, and circles.

ACTIVITIES: (a) The lengths of two sides of a rectangle are 12 in. and 16 in. Find the area of a square whose perimeter is the same as the perimeter of the rectangle.

(b) How many 6" by 6" square tiles are required to cover a rectangular floor that is 18 ft. by 38 ft.?

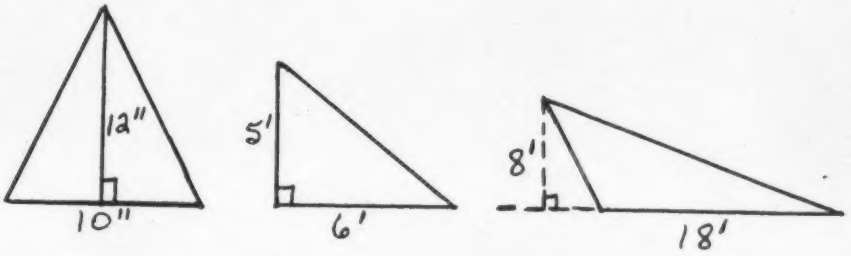


(c) ABCD is a parallelogram.

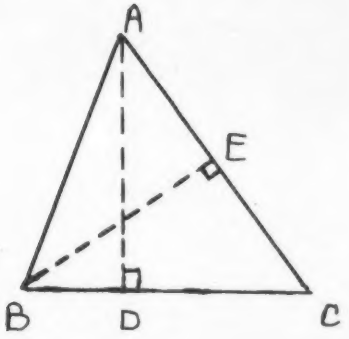
(1) If AE = 7", DC = 12", and BC = 14", find AF.

(2) If AE = 10", AB = 18", and AF = 15", find AD.

(d) Find the area of each triangle.



(e)



(1) If BC = 8, AD = 9, and BE = 6, find AC.

(2) If AD = 14, AC = 21, and BE = 10, find BC.

(f)

(1) Find the area of a circle whose diameter is 56 ft. (Use $\frac{22}{7}$ for π).

(2) The area of a circle is 113.04 sq. in. Find the diameter of the circle. (Use 3.14 for π).

(3) Find the area of a circle whose circumference is 200.96 sq. in. (Use 3.14 for π).

X. J. CONTENT: Geometry; Volume

OBJECTIVE: The student will be able to find the volume of:

(a) A rectangular solid;

(b) A right circular cylinder;

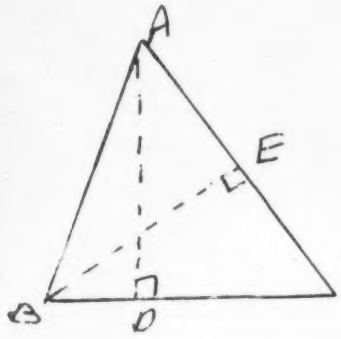
(c) A sphere;

(d) A right circular cone;

(e) A pyramid.

ACTIVITIES:

(a) The length, width and height of a rectangular solid is 10 feet, 4½ feet, and 6 feet, respectively. Find the volume of the rectangular solid.



(b) Compare the volume of a cube whose edge is 4 inches with the volume of a cube whose edge is 8 inches.

(c) The volume of a right circular cylinder is 440 cu. in. If the height of the cone is 10 inches, find the diameter of the base.

(d) The volume of a right circular cone is 264 cubic inches. Find the radius of the base if the height of the cone is 9 inches.

(e) Find the volume of a sphere whose radius is 14 inches. (Use $\frac{22}{7}$ for π).

(f) A pyramid has a square base. If the length of a side of the base is 12 feet and the height of the pyramid is 8 feet, find the volume of the pyramid.

X. K. CONTENT: Geometry; Surface Area

OBJECTIVE: The student will be able to find the surface area of:

(a) A rectangular solid;

(b) A right circular cylinder;

(c) A sphere.

ACTIVITIES:

(a) Find the surface of a sphere whose radius is 7 inches. (Use $\frac{22}{7}$ for π).

(b) The radius of the base of a right circular cylinder is 7 in. If the height of the cylinder is 10 inches, find the total surface area of the cylinder.

(c) All four walls and the ceiling of a rectangular room are to be painted. The room is 30 feet long, 20 feet wide, and 12 feet high. If the area of the windows and doors (not to be painted) is 120 sq. ft., how many sq. ft. of surface area is to be painted?

X. L. CONTENT: Geometry; Constructions

OBJECTIVE: The student will be able to use a straight edge and compass to:

(a) Copy a segment, an angle, and a triangle;

(b) Bisect an angle and a segment;

(c) Construct lines parallel to a given line;

(d) Construct lines perpendicular to a given line.

ACTIVITIES:

(a) Draw any angle. Subdivide the angle into four angles that have the same measure.

(b) Draw any triangle ABC. Copy the triangle by side-angle-side.

(c) Construct an angle whose measure is 30 degrees.

(d) Construct a 30-60-90 degree right triangle.

XI. A. CONTENT: Operations on Integers; Definition

OBJECTIVE: The student will be able to define integers.

ACTIVITIES: Define integers.

XI. B. CONTENT: Operations on Integers; Absolute Value

OBJECTIVE: The student will be able to find the absolute value of an integer.

ACTIVITIES: (a) Perform the indicated operations.

(1) $|-8| =$ _____

(2) $|+7| =$ _____

(3) $|8 - 2| =$ _____

(4) $|7| - |-2| =$ _____

(5) $|x| =$ _____ if $x < 0$

(b) Find two integers whose absolute value is six.

XI. C. CONTENT: Operations on Integers; Addition

OBJECTIVE: The student will be able to add two or more integers.

ACTIVITIES: (a) Use a number line to find the sums.

(1) (+4) + (-7)

(2) (-8) + (-2)

(3) (-8) + (+5)

(4) (+2) + (+6) + (-10)

(b) Add:

(1) $\begin{array}{r} +7 \\ +1 \\ \hline \end{array}$ (2) $\begin{array}{r} -6 \\ -6 \\ \hline \end{array}$ (3) $\begin{array}{r} -3 \\ +2 \\ -4 \\ \hline \end{array}$ (4) $\begin{array}{r} -9 \\ +19 \\ -25 \\ +23 \\ -7 \\ \hline \end{array}$

XI. D. CONTENT: Operations on Integers; Subtraction

OBJECTIVE: The student will be able to subtract integers.

ACTIVITIES: (a) Perform the indicated operations.

(1) $7 - 3 =$

(2) $-7 - 8 =$

(3) $8 - (-4) =$

(4) $-5 + 2 - 3 =$

(5) $-6 - (+2) - (-8) =$

(b) Subtract:

(1) $\begin{array}{r} 4 \\ -3 \\ \hline \end{array}$ (2) $\begin{array}{r} -6 \\ -8 \\ \hline \end{array}$ (3) $\begin{array}{r} 8 \\ -2 \\ \hline \end{array}$

(4) $\begin{array}{r} 0 \\ 8 \\ \hline \end{array}$ (5) $\begin{array}{r} -20 \\ -13 \\ \hline \end{array}$

XI. E. CONTENT: Operations on Integers; Multiplication and Division

OBJECTIVE: The student will be able to multiply and divide integers.

ACTIVITIES: Perform the indicated operations.

(a) $(-13)(+6) =$ (b) $(-4)(-8) =$

(c) $(-2)(-4)(-8) =$ (d) $\frac{-32}{+4}$ (e) $\frac{-32}{-16}$

(f) $\frac{-144}{(-2)(+8)}$ (g) $\frac{(-1)(-4)(-2)}{(-2)(+8)}$

XI. F. CONTENT: Operations on Integers; Applications

OBJECTIVE: The student will be able to solve verbal problems that involve integers.

ACTIVITIES: (a) The temperature was 9° below zero. It rose 8°. What was the new temperature?

(b) The temperature in Chicago on January 7, 1979, was 14° below zero. In Little Rock, the temperature was 2° above zero. How many degrees colder was it in Chicago?

(c) Joan has no money. She charges five pairs of hose at the dress shop for $2.00 each. Represent Joan's account with the shop as a positive or negative integer.

(d) Jim carries a football five times and loses four yards on each carry. Express his net yardage as an integer.

(e) Determine if the square is a magic square.

-8	+6	-4
+2	-2	-6
0	-10	+4

(f) Determine if the square is a magic square.

+16	-40	0
-24	-8	+8
-16	+24	-32

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